Support more customers accessing MySQL ecommerce sites with Amazon EC2 M6i instances

Featuring 3rd Gen Intel Xeon Scalable processors, M6i instances outperformed M5 instances with older processors

Forecasts predict that in 2021, ecommerce sales will continue to accelerate, with expected year-over-year growth of 17.9%.[1] For organizations hosting online transaction processing (OLTP) databases in the Amazon Web Services (AWS) cloud, this increase in user demand may mean expanding your cloud capacity to handle their needs. New Amazon EC2 M6i instances feature the latest 3rd Generation Intel® Xeon® Scalable processors to meet these growing demands.

At Principled Technologies, we used a TPROC-C workload from the HammerDB benchmark to compare MySQL™ Database performance of two instance types: new M6i instances with 3rd Gen Intel Xeon Scalable processors and M5 instances with older processors. For both smaller and medium-sized databases, we found that M6i instances with 3rd Gen Intel Xeon Scalable processors offered consistently stronger OLTP database performance than the previous-gen instances. These performance gains show that by choosing M6i instances, organizations can support more customers accessing ecommerce sites to meet rising consumer demands.

1.32x
the transactions per minute
on 8 vCPU instances

1.38x
the transactions per minute
on 16 vCPU instances

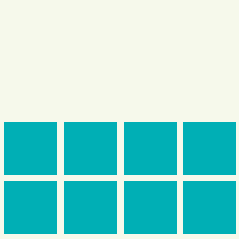
How we tested

We purchased two sets of instances from two general-purpose AWS EC2 series:

- Newer M6i instances featuring 3rd Generation Intel Xeon Platinum 8375C processors (Ice Lake)
- Older M5 instances featuring Intel Xeon Platinum 8175M processors (Skylake)

We ran each instance in the US East 1 region.

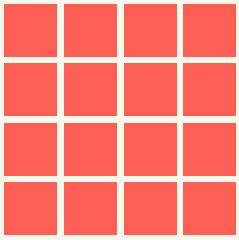
Figure 1 shows the specifications for the instances that we chose. To show how businesses of various sizes with different ecommerce demands can benefit from choosing M6i instances, we tested small (8 vCPU) and medium (16 vCPU) instance sizes.



Small

8 vCPUs

MySQL Database:
250 warehouses (22GB)



Medium

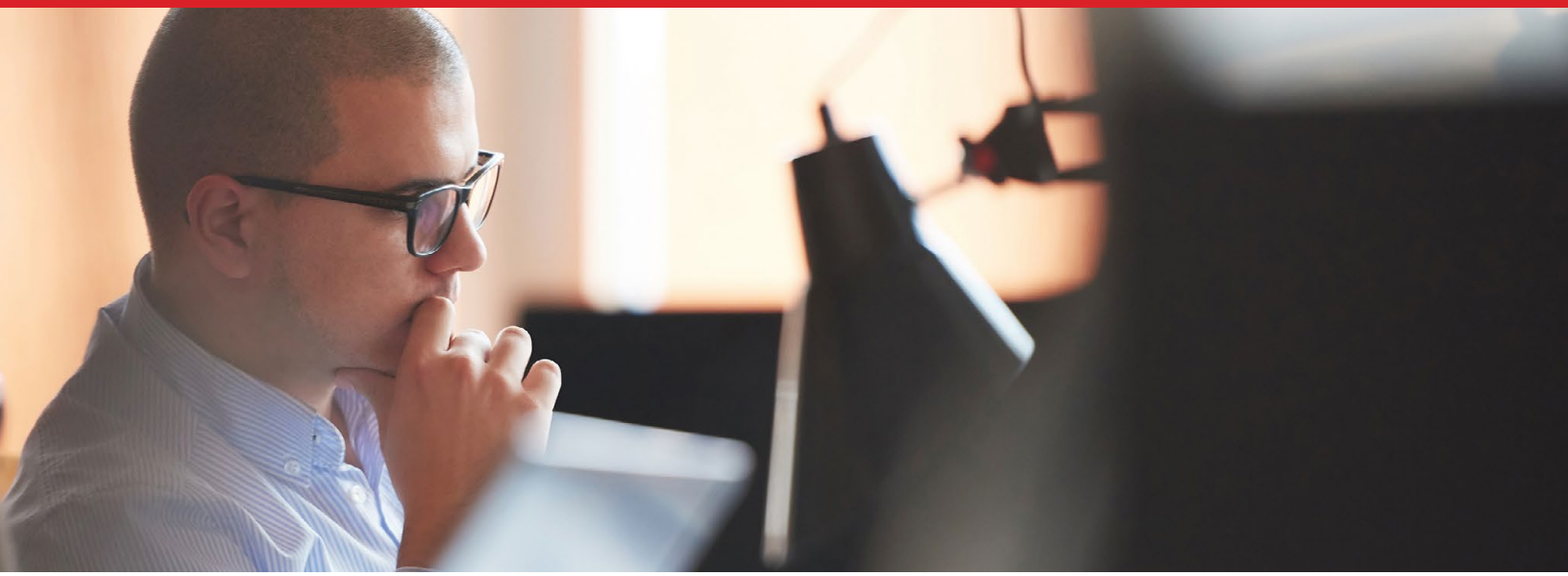
16 vCPUs

MySQL Database:
500 warehouses (45GB)

Figure 1: Key specifications for each instance size we tested. Source: Principled Technologies.

About the HammerDB workload

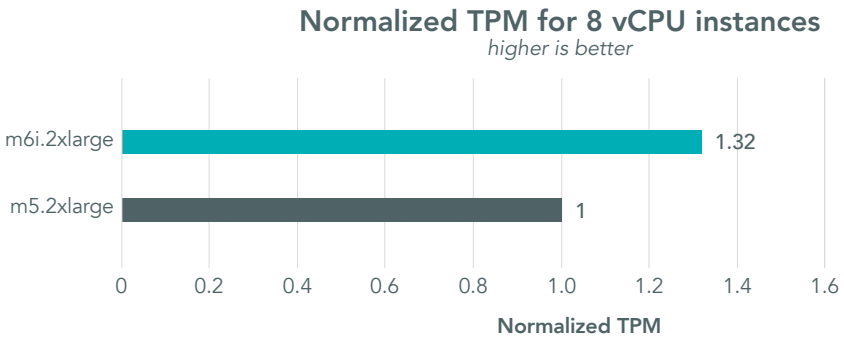
To test the instances, we used a TPROC-C OLTP workload from the HammerDB benchmarking suite. OLTP workloads assess how well an environment can handle online transactions like those you would find in online banking, retail, or other ecommerce sites. The benchmark reports results in transactions per minute (TPM). HammerDB developers derived their OLTP workload from the TPC-C benchmark specifications; however, as this is not a full implementation of the official TPC-C standards, the results in this paper are not directly comparable to published TPC-C results.



Amazon EC2 M6i instances supported more database transactions per minute

For both instance sizes we tested, Amazon EC2 M6i instances featuring 3rd Gen Intel Xeon Scalable processors improved database performance for online transaction processing workloads.

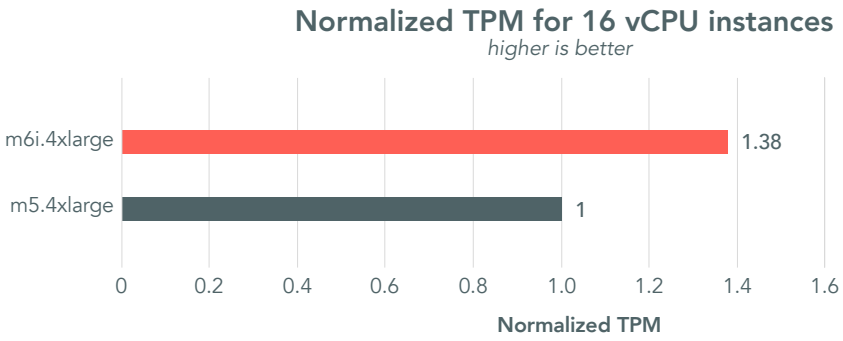
Figure 2 compares the relative MySQL transactions per minute both instance types achieved when using a 22GB database on small, 8 vCPU configurations. The M6i instances enabled by 3rd Gen Intel Xeon Scalable processors handled 1.32 times the transactions per minute of the older M5 instances.



1.32x
the transactions per minute

Figure 2: Relative number of transactions per minute that the small-size instances (8 vCPUs) with a 22GB MySQL database handled using the HammerDB benchmark. Higher numbers are better. Source: Principled Technologies.

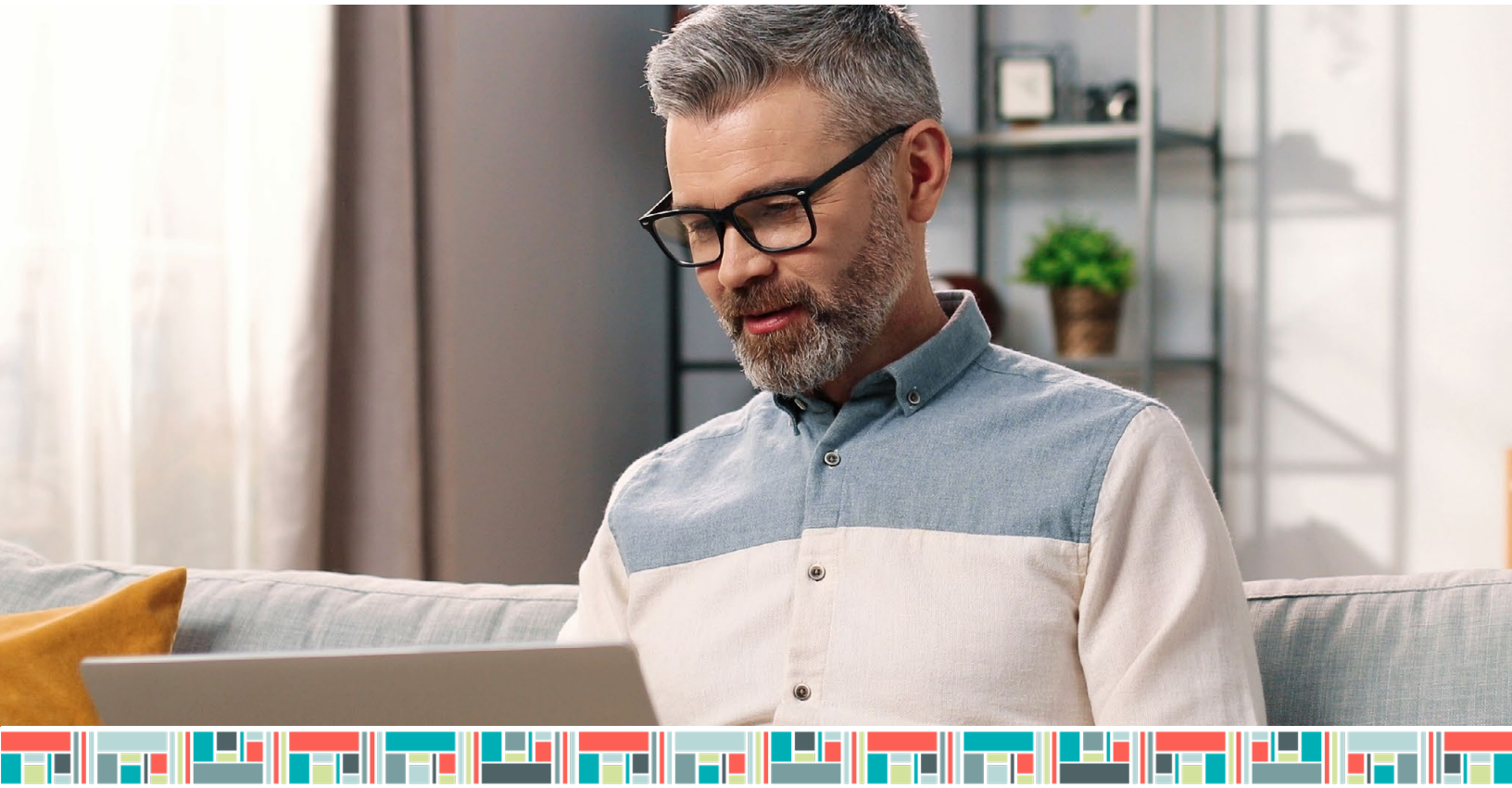
Figure 3 compares the relative MySQL transactions per minute both instance types achieved when using a 45GB database on medium-sized 16 vCPU configurations. As in the small instance testing, the M6i instances with 3rd Gen Intel Xeon Scalable processors significantly outperformed the M5 instances in OLTP database performance, achieving 1.38x the transactions per minute.



1.38x
the transactions per minute

Figure 3: Relative number of transactions per minute that the medium-size instances (16 vCPUs) with a 45GB MySQL database handled using the HammerDB benchmark. Higher numbers are better. Source: Principled Technologies.

Our tests showed that M6i instances provided consistent MySQL database performance improvement on both instance sizes we tested. This sizable increase in MySQL performance could allow you to support your database workloads and provide a responsive experience for customers on fewer numbers of instances. Plus, added capacity can allow your organization to handle an influx of customers at peak times, such as during holiday shopping times or large sales.



About 3rd Generation Intel Xeon Scalable processors

According to Intel, 3rd Generation Intel Xeon Scalable processors are "[o]ptimized for cloud, enterprise, HPC, network, security, and IoT workloads with 8 to 40 powerful cores and a wide range of frequency, feature, and power levels."[2] Intel continues to offer many models from the Platinum, Gold, Silver, and Bronze processor lines that they "designed through decades of innovation for the most common workload requirements."[3]

For more information, visit http://intel.com/xeonscalable.

Why choose M6i instances?

Compared to older M5 instances, new M6i instances offer:

- 3rd Gen Intel Xeon Scalable processors (all-core turbo frequency of up to 3.5 GHz) with support for Intel Total Memory Encryption (TME) and Intel Advanced Vector Extensions (AVX 512) instructions
- Support for up to 128 vCPUs per instance, a 33% increase over M5 instances[4]
- Up to 50 Gbps networking (twice the bandwidth of M5 instances)[5]

Conclusion

In 2021, many businesses running ecommerce websites in the AWS cloud are facing a fortunate challenge: meeting increased customer demand. As our test results show, one way to do that is to select Amazon EC2 M6i instances featuring 3rd Generation Intel Xeon Scalable processors over M5 instances with older processors. These latest instances handled up to 1.38 times the transactions per minute of the previous-gen instances, a significant increase that can help you keep up with new business.

By choosing AWS EC2 M6i instances with 3rd Gen Intel Xeon Scalable processors, your organization can support more customers accessing your ecommerce sites than with older M5 instances.

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1. eMarketer, "US Ecommerce Forecast 2021," accessed September 28, 2021, https://www.emarketer.com/content/us-ecommerce-forecast-2021.
2. Intel, "3rd Gen Intel® Xeon® Scalable Processors," accessed September 28, 2021, https://www.intel.com/content/www/us/en/products/docs/processors/xeon/3rd-gen-xeon-scalable-processors-brief.html.
3. Intel, "Intel® Xeon® Scalable Processors," accessed September 28, 2021, https://www.intel.com/content/www/us/en/products/details/processors/xeon/scalable.html.
4. Amazon, "Amazon EC2 M6i Instances," accessed September 28, 2021, https://aws.amazon.com/ec2/instance-types/m6i/.
5. Amazon, "Amazon EC2 M6i Instances," accessed September 28, 2021, https://aws.amazon.com/ec2/instance-types/m6i/.

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